September 2003

France: Environmental Issues

Introduction

France's economy was badly shaken by the oil shocks of the early 1970s. With little in the way of indigenous energy resources and only limited opportunities for increasing electricity generation using hydropower, at the time France imported almost all of its oil and natural gas. The 1973 Arab oil embargo and the resulting price shocks highlighted France's overwhelming dependence on imported petroleum supplies to meet domestic demand.

In the aftermath of the oil shocks, the French government took the critical step to reorient the country's energy policy, pledging to achieve energy independence by reducing its reliance on foreign energy supplies. As such, France undertook a crash program to develop and expand its nuclear power industry, with the issue of national energy security underpinning and hence driving the program. Although France still must rely on imported oil and natural gas, the development of the country's nuclear power program has reduced this dependence, providing France with additional insurance against future energy supply disruptions.

In addition to reducing energy imports, France's nuclear program has become a critical component of the country's environmental protection efforts, which began in earnest with the establishment of the French Ministry of the Environment in 1971. By developing and enhancing its nuclear energy options, France has been able to adhere to the goals stated in the Environment Ministry's mission: monitor the environment, protect nature, prevent, reduce, or totally eliminate pollution and other nuisances, and enhance the quality of life. The Ministry has carried out its mission in two main ways--by preserving and protecting spaces and species, and by developing research to improve environmental knowledge. The use of nuclear energy has reduced France's pollution from carbon emissions and other greenhouse gases, although significant questions remain with regard to the long-term disposal of nuclear waste.

Air and Marine Pollution

Despite its nuclear power program, France still suffers from air pollution, especially in Paris and other major cities. Likewise, despite the country's reduction in its dependence on oil imports, France has been the unfortunate victim of several major oil tanker spills, with disastrous consequences for the country's tourism and fishing industries along the Atlantic Ocean coast.

Air Pollution

Transportation has become the main cause of air pollution in France. According to a European Commission report, over 50% of emissions such as nitrogen oxides (NOx) or carbon monoxide come from road transport vehicles. A European Commission survey found that 70% of Europeans are more worried now about air quality than they were 10 years ago. In addition, the survey found that air pollution was at the top of Europeans' list of environmental concerns, with traffic being

blamed as the number one culprit.

In Paris, about 3 million cars enter the capital daily, and the resulting smog that engulfs the city causes health problems like asthma and chronic coughing, filling emergency rooms with people suffering from bronchial ailments. The French tourist industry is becoming worried that visitors to Paris will depart with memories of clogged streets, hazy skies, and pictures of the Eiffel Tower shrouded in smoke. France is also the biggest emitter of dioxins in Europe.

To control its air pollution problem, the French Environment and Energy Control Agency (ADEME) is equipping the country with a monitoring system that meets the requirements of the national Air Pollution Act. The International Energy Agency (IEA) has recommended that France increase its air quality monitoring and emission reduction efforts, as well as formulate and implement measures to enhance the use of environmentally sound fuels in order to tackle urban pollution problems.

In addition to supporting investments to clean up industrial processes, ADEME is stepping up its work in the transport sector, attempting to change individuals' behavior by encouraging the use of public transport. In that vein, the French government regularly has promoted the annual "European Car-Free Day." French refineries have also introduced a range of cleaner fuels for French motorists (especially in Paris) which should lead to a significant reduction in automobile and transport emissions. BP's Ultra Low Sulfur Diesel (ULSD), which was launched in Paris in September 1999, reduces emissions by 90% on all diesel vehicles, without any detrimental impact on performance and at no extra cost. BP claims that ULSD also reduces other emissions substantially and enables new particulate reduction technology to be fitted on buses and other transport vehicles.

Marine Pollution

France has been the victim of two major oil tanker spills in the past five years, resulting in significant environmental damage to the country's coastal areas, as well as economic harm to France's fishing and tourism industries. On December 12, 1999, the 25-year-old Maltese-registered oil tanker *Erika* broke in two and sank in stormy seas off the Brittany Coast of France, spilling nearly 90,000 barrels of heavy oil into the Bay of Biscay. Although the oil spill occurred over 50 miles from shore, stormy weather and easterly winds conspired against cleanup efforts, and shortly thereafter part of the 14-mile oil slick began washing up on the French coastline. The oil spill killed tens of thousands of birds, destroying fish and oyster grounds, and eventually covered more than a 250-mile stretch of coastline, damaging tourism for months afterward. As a result of this disaster, the European Parliament passed a resolution urging member states to impose tougher shipping laws.

On November 19, 2002, the *Prestige*, a 26-year-old, single-hull tanker carrying some 77,000 tons of oil sank 160 miles off of the northwestern Spanish coast. In an all-too-familiar sight for French citizens, oil from the sunken tanker began to leak and high winds carried the oil north towards France's Atlantic Coast. In addition to the pollution of Spain's Galicia and Asturias regions and northern Portugal, some 125 miles of French beaches, from the southwest corner of the country halfway up the Atlantic Coast to the port city of La Rochelle, were polluted by the thick sludge emanating from the *Prestige*.

Although the *Prestige* oil spill was not as ecologically damaging to France as the *Erika* disaster, the *Prestige* incident nonetheless galvanized France into taking action to prevent future oil spill catastrophes. In March 2003, the European Union agreed to ban large single-hull tankers carrying heavy-grade oil to and from European ports. The ban, which is a collective decision, is to go into effect in 2005.

France went further, however, adopting a measure to create a new maritime ecological zone in the Mediterranean Sea in an effort to reduce the effects on the French coastline of pollution from shipping and attempt to exercise greater control over tanker traffic. The Mediterranean is a major world shipping route linking the Atlantic Ocean with the Suez Canal, as about 25% of global oil traffic goes through the Mediterranean, according to French government figures. The French Environment Ministry said that in 2002 it recorded over 200 incidents of ships intentionally polluting waters, mostly by pumping out ballast, but it could intervene in only a handful of cases because the vessels were outside the 12-mile zone where France has jurisdiction.

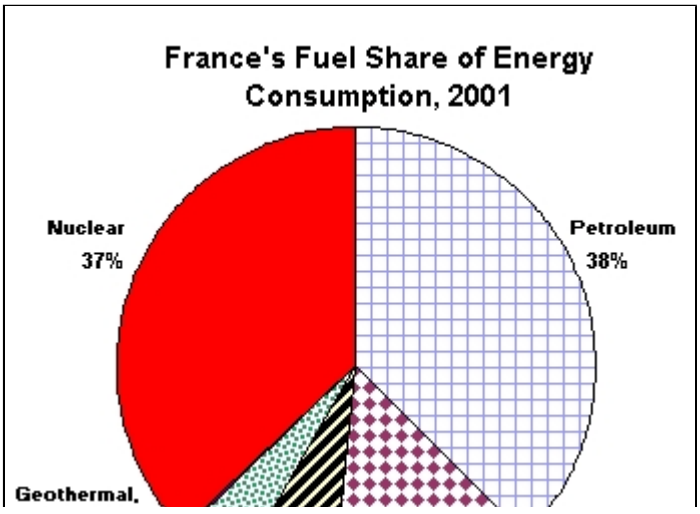
The International Maritime Organization (IMO), the United Nations agency for shipping, has established rules against the dumping of the sea water carried to stabilize a vessel since this is often contaminated with oil and other materials. The IMO has cited studies showing 70% of worldwide oil pollution at sea comes from shipping operations, compared with only about 20% due to accidents. Following the *Prestige* spill, in April 2003, the French government passed a law establishing a 90-mile ecological zone in an effort to deter ships from dumping dirty ballast in its coastal area. Under the new French law, France reserved the right to levy fines of up to $600,000 and to impose four-year prison sentences on captains of tankers and other large vessels caught polluting within the 90-mile zone.

Although France's efforts to crack down on oil pollution on the high seas has been admirable and most of France's neighbors in the Mediterranean support France's extended ecological zone, environmental organizations say France has been lax in enforcing measures that could check maritime pollution. According to Greenpeace France, the French government blocked debates for the past three years on creation of an Agency of Maritime Control. In addition, the organization claims that, over the last 20 years, France has inspected less than 10% of ships entering French ports, instead of the minimum of 25% demanded by the U.N. Convention on Maritime Rules. In 2002, France inspected only 558 ships, while Greece checked 751, Belgium 1,679, and the United Kingdom 1,801. France was subpoenaed before the European Court of Justice over this failure to meet its international obligations.

France has also run afoul of European regulators for noncompliance with the Surface Water Directive. On March 8, 2001, the European Court of Justice ruled against France for failing to comply with limits for nitrates as required under the directive. The court also criticized France because the measures which the French government have taken lack the necessary coherence in order for them to constitute a systematic plan of action to combat pollution.

Energy Consumption

France's total energy consumption in 2001 was 10.5 quadrillion Btu (quads), approximately 2.6% of the world's total energy consumption. After holding steady for most of the 1980s, French energy consumption, which was 8.5 quads in 1980, rose consistently in the 1990s, topping 10 quads in 1998 and accelerating faster since the start of this decade.



Even with this increase, France's per capita energy consumption in 2001, at 178 million Btu, was only about half the level of the United States (342 million Btu per

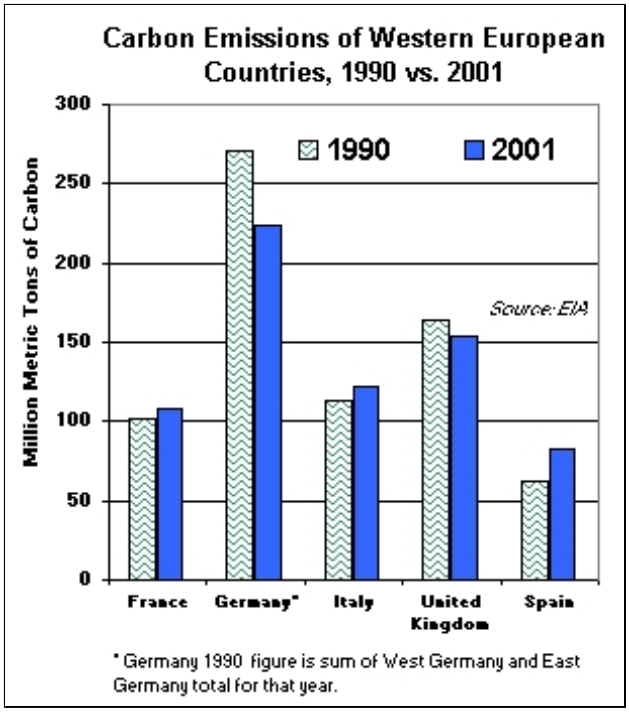
capita energy consumption). However, France's per capita energy consumption exceeded that of its neighbors in western Europe, as Germany (174 million Btu), Spain (165 million Btu), the United Kingdom (142 million Btu), and Italy (140 million Btu) all had lower per capita consumption energy consumption levels in 2001.

At 38%, petroleum still accounts for the largest fuel share of France's energy consumption, but just barely; nuclear power is right behind petroleum, accounting for 37% of the total. Natural gas (14%), hydroelectric (7%), and coal (4%) accounts for rest, as combined geothermal, solar, and wind power consumption makes up less than 1% of France's total energy consumption.

Carbon Emissions

France's commitment to the use of nuclear power has allowed the country to keep a lid on its carbon emissions, since nuclear power emits no carbon or other greenhouse gases. Since 1980, when France emitted approximately 136 million metric tons of carbon, the country has cut its energy-related carbon emissions by just over 20%, to 108 million metric tons in 2001. By contrast, carbon emissions by the United States over that same time period have grown by almost 22%, from 1.29 billion metric tons of carbon in 1980 to 1.57 billion metric tons in 2001.

France's carbon emissions make up approximately 1.6% of the world's total, according to EIA data. France's per capita carbon emissions are the lowest among the major Western European countries and are on the decline. In 1980, per capita carbon emissions in France stood at 2.52 metric tons of carbon equivalent, but that figure declined to 1.83 metric tons of carbon equivalent by 2001. In comparison, per capita carbon emissions in 2001 in Germany (2.71 metric tons of carbon equivalent), the United Kingdom (2.59), Italy (2.10), and Spain (2.05) were all higher than in France.



France is an Annex I country under the UN Framework Convention on Climate Change. France pledged to limit its carbon emissions to the 1990 level (which was 102 million metric tons) under the 1997 Kyoto Protocol. Although France has made good progress in reducing its carbon emissions since 1980, France's emissions have increased by 5.9% compared to the 1990 baseline. Nevertheless, France is insistent that it will meet its commitments under the Protocol, which it signed on April 29, 1998 and approved on May 31, 2002, along with other members of the European Union. France's 'approval' of the Protocol gives it the same binding status as would ratification by the French parliament.

In January 2000, the French government's Inter-Ministerial Greenhouse Effect Mission (MIES) unveiled an extensive, detailed plan for the 2000-2010 period to curb carbon emissions. France was the first country to announce such measures to meet its commitments under Kyoto. The 96-point plan includes an initial carbon tax of $23 to $30 per metric ton of carbon emitted, rising to about $75 by 2010. The tax is applied to the General Tax on Polluting Activities, an ecology tax that was introduced in 1999, which will be gradually extended to energy consumption by businesses and by electricity producers. In February 2003, the French government and MIES introduced new measures under "Climate Plan 2003" to

ensure that France meets its commitments under the Kyoto Protocol.

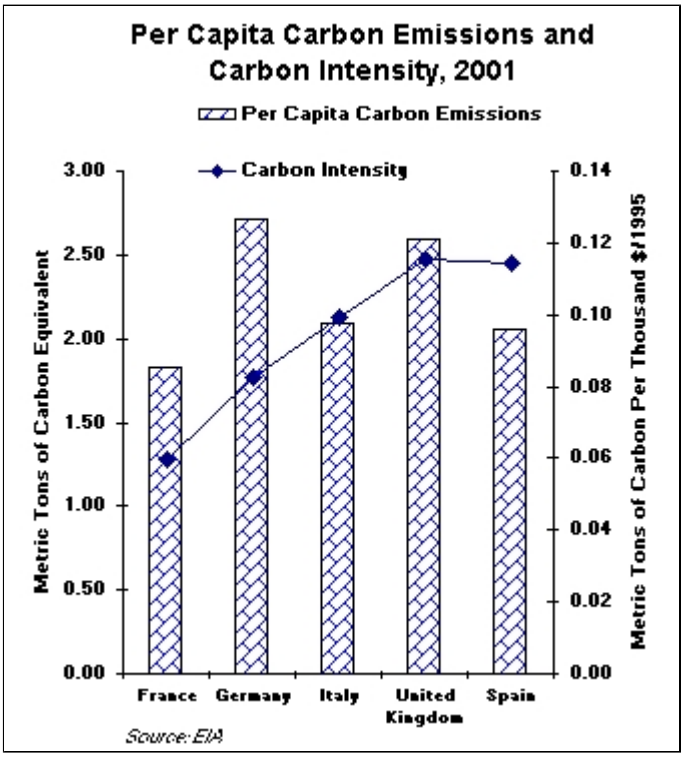
Most of the burden of reducing France's greenhouse gas emissions will fall onto French industry, even thought it is responsible for only around one-third of total French emissions. In order to meet Kyoto commitments, French industry will need to make a 20%-30% emission reduction. In comparison, the January 2000 MIES program aims to stabilize (at 40 million metric tons) by 2020 carbon emissions from the transportation sector, which accounts for 39% of France's carbon emissions.

According to the French business association, between 1990 and 2002, French steel plants reduced their specific emission of CO2 by 22%, while increasing their steel production by 13%. The group estimates that steelmakers have avoided the emission of 46 million tons. According to an official November 2002 MIES report on France's progress towards meeting its Kyoto goals, the country's carbon dioxide emissions have been brought down 15.5% from 1990 to 2001 (EIA data shows otherwise). The report stated that French industry has reduced emissions by 25 % over this period, and energy generation companies by 22%.

However, the report showed that France's emissions from transport and home heating have increased during the same time period. The MIES report stated that carbon emissions from transport have risen more than 26% since 1990, and emissions from house heating more than 12%. These two sectors produced 47% of greenhouse gases emitted in France in 2001, according to MIES.

Energy and Carbon Intensity

Efforts by successive French governments to improve energy efficiency and to promote conservation have reduced the country's level of energy intensity. France's preference for nuclear-generated electricity over thermal (oil-, natural gas-, and coal-fired power plants) power has allowed it to maintain relatively low levels of energy intensity and carbon intensity.



In 2001, France's overall energy intensity, at 5,805 Btu per 1995$ was slightly higher than that of Japan (3,879 Btu per 1995$) and Germany (5,312 Btu per 1995$), but below that of the Italy (6,618 Btu per 1995$), the U.K(7,349 per Btu 1995$), and Spain (7,880 Btu per 1995$), as well as considerably lower than the U.S. (10,736 Btu per 1995$). To reduce its energy intensity further, France is undertaking efforts to improve energy management. These efforts, especially in research, will focus on transport, new buildings, household equipment, and innovations in small- and medium-sized industries employing industrial processes that are energy efficient and clean.

France's move towards nuclear energy and away from fossil fuels such as coal is clearly evident in its reduced level of carbon intensity. In 2001, France's carbon intensity was 0.06 metric tons of carbon per thousand 1995$--exactly half the country's carbon intensity level in 1980. France's level

of carbon intensity in 2001 compares favorably with its neighbors in western Europe, as the UK (0.12 metric tons of carbon per thousand 1995$), Spain (0.11), and Italy (0.10), and Germany (0.08) all posted higher levels of carbon intensity than France in 2001.

Renewable Energy

Due to its lack of indigenous energy resources, France's energy self-sufficiency depends to a great extent on conserving energy and developing renewable energy sources. Hydroelectric power accounts for 7% of the country's overall power consumption, but there is little in the way of additional potential. Although the country's consumption of geothermal, solar, and wind power has been increasing in recent years, reaching 0.04 quadrillion Btu in 2001, it still makes up less than 1% of the country's overall energy consumption.

The European Union has established a target of deriving at least 20% of national electricity needs from renewable sources by 2010. Recognizing that something must be done to spur the growth of renewable energy, the French government, in its January 2000 plan to meet its Kyoto commitments, included several long-term structural measures to encourage the use of renewable energy resources. However, renewable energy use will not see a real surge until the French government removes market barriers (such as subsidies for other energy sources) that inhibit the use of renewables for electricity and heat production. Currently, France has only about 80 MW of installed wind power (compared to about 3,000 MW in Germany).

Nevertheless, France is trying to promote wind power in the country by extending the public service policy tax to households. CRE, the French regulator, says that prices will have to rise in order to meet the government's target of providing 21% of power consumption by renewable means by 2010.

Nuclear Energy

When France initiated its nuclear energy program in the early 1970s, environmental protection issues did not generate the concern that they do today in Western countries. Although domestic opposition has been increasing, France has maintained its position that nuclear energy, because it does not pollute the same way that coal, oil, or natural gas do, contributes to the preservation of the environment. Since nuclear energy does not release nitrogen, sulfur, carbon, or dust into the atmosphere, France has argued that nuclear power is one of the best responses to demands for environmental protection.

Between 1980, when nuclear energy provided just 15% of France's electricity, and 2001, when the share of nuclear-generated electricity rose to around 75%, France has recorded sizable reductions in emissions of harmful pollutants from energy generation. During that time period, sulfur dioxide emissions, which to a large degree are responsible for acid rain, decreased by 70%, reductions in nitrous oxides that contribute to smog were 12%, and dust emissions were reduced by 52%. According to the Ministry of Industry, French nuclear power plants prevent the emission of 1.7 million tons of sulfur dioxide and 890,000 tons of nitrous oxides each year.

Since France has a good nuclear safety record, and since power produced by French nuclear plants is one of the least expensive forms of energy in the EU, nuclear energy is a natural export market for France. However, France's unilateral decision in 1995 to resume nuclear weapons testing in the South Pacific - which came despite the condemnation of European ecologists, "green" politicians, and anti-nuclear pressure groups across the globe - angered many of its neighbors who do not share France's commitment to the nuclear option and highlighted France's nuclear energy stance. In addition, recent surveys show weakening support for nuclear power among French citizens themselves, especially as France begins dealing with the problem of long-term storage and disposal

of nuclear waste with the planned decommissioning of older nuclear power plants.

Environmental Outlook

France's environmental outlook appears positive, as successive French governments have demonstrated their commitment to protect the environment, and future governments are expected to continue the trend. France has pledged to meet its goal of reducing carbon emissions in line with its Kyoto Protocol commitments (or at least attempt to do so), and in an effort to prevent marine pollution, the country has been a leading force behind European efforts to ban single-hull tankers and apply more stringent shipping conditions to oil tankers.

Following the twin blows from the *Erika* and the *Prestige* tanker spills, France is taking a more proactive approach to environmental protection. In June 2003, France's Cabinet of Ministers approved a plan that would modify the French constitution to give environmental protection as much weight as human rights. French President Jacques Chirac is the driving force behind the "environment charter," a bill that attempts to make France a world leader in promoting environmental concerns.

The charter has 10 articles, the first of which says that "everyone has the right to live in an environment that is balanced and healthy." The charter also says that people must pay damages for harming the environment. Under current French law, for example, if there is an oil spill, fisherman can claim damages if their nets are ruined or sales are hit. The new charter takes that one step further, holding polluters financially responsible for soiled-beaches and slick-covered birds. If it is passed, the bill would require the preamble of the French constitution to be changed to mention the new environment charter. The bill is expected to go before the French parliament this fall.

France is also a leader in adopting the European Commission's 'green paper' on corporate social responsibility, which requires listed companies to publish information relation to the environmental and social impact of their activities in their annual reports. Thus, companies in France must report on their use of water and natural resources, their emissions of greenhouse gases and energy consumption, and what efforts they have undertaken to reduce environmental risks and to educate employees about environmental management.

On the other hand, there is still room for improvement. The IEA has chastised France because the country's progress in promoting energy efficiency has stalled during the past decade, mainly due to low energy prices and a slackening of government efforts. Government subsidies for energy efficiency investments and funding for research and development programs have experienced a sizable reduction. In addition, France is under pressure from the European Union to liberalize its energy sector.

According to the IEA, France can boost its energy efficiency simply by fully implementing existing regulations in the industrial, commercial, government, and residential sectors. By continuing to monitor and evaluate the cost-effectiveness of energy efficiency programs, France should be able to determine which programs are the most beneficial. However, the IEA believes that France must institute a major new program of energy efficiency measures across all end-use sectors; only then will the country be able to harness its significant energy savings potential.

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